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THE GENESEE FARMER.

SATURDAY, DECEMBER 22, 1838.

☞ The publication of this number has been some days delayed by our inability to procure paper in season for it.

Highland Agricultural Society of Scotland.

By the politeness of our friend, Mr. William Garbutt, of Wheatland, in this county, we have been favored with the supplement to the Glascow Chronicle of Sept. 28, (in advance of our English Agricultural Magazines) giving an account of the cattle show and fair of that society, which was this year held in that city, and as usual collected an immense crowd of distinguished foreigners, noblemen, and farmers, from all parts of the United Kngdom.

Perhaps the world does not furnish an example of greater benefits conferred on any country by the labors of a single society, than Scotland has received from this institution; and the influence of its example, and the excellent essays it has published, have extended these benefits in a greater or less degree over the world. The society was instituted in 1784, and its object being primarily the introduction and improvement of agriculture in the Highlands, it was called the 'Highland Society,' but it met with such favor, and its sphere of usefulness so rapidly extended, that when rechartered, it took the name of 'Highland and Agricultural Society of Scotland.'

As the best means of eliciting and diffusing knowledge, as incitements to industry, and as rewards for useful undertakings, the Society has annually distributed large sums in premiums; and has regarded from the first, as fitting objects of encouragement, every application of useful labor that might tend to the general good. The society found the agriculture of Scotland in the most barbarous state; and in no country of Europe was the labor of the husbandman so poorly rewarded. Now, with the exception of Belgium and part of Holland, farming is better understood, and the farmer better rewarded for his labor in Scotland, than in any other part of the old world. The advancement in civilization and in the arts that belong to social life has been in a corresponding ratio, and the 'wild Highlanders,' as they were called, have begun to appreciate and understand the comforts of good living. At the formation of the society, the animals kept by the farmers of the country, were, with few exceptions, of the worst quality, but a spirit of improvement was soon diffused, and by the judicious and persevering labors of a few individuals, by the introduction of better breeds, and crossing with the native stock, Scotland is now in possession of some of the best cattle in Great Britain.

The society has done more for the improvement of agricultural science, agricultural chemistry, and agricultural implements, than any other institution of the kind. Its means have been ample, and they have been efficiently directed. In the number and magnitude of its prizes it has been without a rival. The list of premiums offered by the lately formed English Association, shows however, that this is no longer the case. Within a few years liberal premiums have been offered for the best steam plough. Several have been invented, improvements greatly simplifying and lightening the machine are yearly made; and the probability is that a steam plough will ere long cease to be a rarity. In what part of the world could they be more profitably used than in the prairies of our great west? The premium for the present year is $2,000.

The extent of the society's operations may be inferred from the fact that in cattle alone there were 31 classes of premiums awarded, varying from 25 sovereigns down to 3 sovereigns The number of cattle exhibited was 461: horses 121; sheep 274; swine 47; making an aggregate of 903 head—119 more than were ever exhibited at any previous show of the society. Mr. Stevenson, the American Ambassador, the Marquis of Tweedale, the Earl of Melville, Lord Meadowbank, the Lord Provost, &c. &c. dined with Dr. Cleland of the University. We are pleased to observe the interest which Mr. Stevenson takes in investigating all the forms of society in England, and in particular its agriculture and manufactures. In one of our late foreign magazines, we noticed that he was present at a meeting, we think in Norfolk, under the patronage of the Earl of Leicester, at which he gave an account of the labor and profits of an American sugar plantation, and farming on the prairies, which attracted great attention. His remarks on the present occasion, when the toast "Prosperity to the United States," was given and drank with enthusiasm, were worthy of the man and his country.

It is when we read the reports of such noble institutions, and witness the extensive benefits they confer on any country in which they exist, that we regret the supineness of the American public, and the unworthy, illiberal policy of the general and state governments on the subject of agriculture. There is no country in which societies of this kind would be more useful, or are more needed. Had the Highland Ag. Society done nothing more than publish the valuable papers embodied in Quarterly Journal of Agriculture, one of the most useful works on agriculture and the collateral sciences the world has yet seen, it would have amply repaid all that has been expended by the people of Scotland in its support.

LIGHTNING RODS.

We have recently had frequent occasion to observe the recommendation of glass insulators for lightning rods, as being absolutely necessary for their successful operation. We have been sorry to observe it, fearing that from the difficulty of procuring such insulators, many would be deterred altogether from erecting rods, as glass has no practical advantage over wood. If the rod is kept one foot from the building by means of dry painted wood supports, no danger need ever be feared. Iron is so immeasurably better a conductor than wood that there is no possibility of the course of the electric fluids being changed from the rod by the latter,* if other requisites are attended to. But the following are absolutely essential to every lightning rod:

1. That it be *sharply pointed* at the upper extremity.
2. That it be *continuous* throughout.
3. That it terminate in some *permanent conducting body.*
4. That it be of sufficient height.

It is necessary that the point be kept sharp, in order to discharge silently any highly electrified cloud which may pass over, and thus prevent an explosion. An acute and pointed silver cap fitted to the upper extremity, is an easy and cheap mode of effecting this object. It is also necessary that it be continuous, that the electric fluid may pass uninterruptedly to the earth; hence where the rod must consist of more than one piece, link joints, which partially break the continuity, should be avoided, and each end of the rod screwed into a common nut, which by the close contact of the surfacer, will furnish uninterrupted passage. It is requisite that it terminate in some permanent conducting body, that the fluid may finally and freely escape to the body of the earth, otherwise by attracting it, without affording afinal passage for it, the rod, instead of affording protection, would at once become a source of actual danger. Hence, instead of penetrating the surface of the earth but a foot or two, as is too frequently the case, it should descend to the depth of not less than six feet, where the ground may ever be moist and consequently a conductor. A bed of charcoal, which is a good conductor, placed in the earth at the foot of the rod, would facilitate the dissipation of the fluid. The height above the building is in most cases altogether insufficient. It is found that a rod will protect completely a circular space whose diameter is four times the height of the rod above it. Hence a rod placed at one end of a building thirty feet long, to afford perfect protection, should be fifteen feet high above it; or if placed at each end, seven feet.

J. J. T.

* A leaden jar, charged to the highest possible degree, may be discharged by a metallic rod held in the naked hand, without perceiving the slightest shock. But the hand is a much better conductor than dry wood. The case of the lightning rod is analogous.

IMPROVED PRAIRIE PLOUGH.

Every man acquainted with the fertile west, knows that one of the most serious difficulties the settler on the prairie lands has to encounter in the way of immediate profit, is the difficulty of breaking up the strong and close turf which has been forming for ages. With the common plough ten or twelve oxen are required, and even then it is a work of difficulty to break the multitude of roots, as thick as the finger, that penetrate the soil. Mr. Ellsworth in his book rates the expense of breaking up prairie at $2 25 per acre. He says:—

"The expense would be lessened by the increased value of young cattle taught to work during the process. Two old and well trained yokes, one to lead, and the other at the plough, with four or five pair of young cattle in the middle, constituted a most efficient team. An advance on each yoke of steers may be obtained on the completion of the work from fifteen to twenty dollars."

A writer in the New Yorker, who signs himself a "Western Man," gives the following statement of beginning farming in Illinois.

"Unimproved land may be purchased in Illinois, at from three to five dollars per acre. It will cost $2 50 per acre to break smooth prairie. Ordinarily the first crop of corn is from 10 to 15 bushels per acre; the second crop thirty bushels; and the third fifty bushels per acre; and after that by cultivation it may be increased to 80 bushels. It requires one year for the turf to rot, lying precisely as it is turned over, and the corn put in either with the axe,* or dropped in between the furrows. The second year it is cross ploughed. The amount of team necessary to break, is from 8 to 12 yoke of cattle, worked four abreast; but two yoke is sufficient to cross plough, varying with the soil."

The necessity of having something done to lessen the quantity of team required, and of consequence the expense of breaking up was therefore apparent, and an improvement in the construction of the plough seemed most likely to accomplish this end. Mr. Dutcher, whose ploughs have proved so excellent for ordinary purposes, was induced to turn his attention to the subject; and at the last Fair of the American Institute he presented one, which bids fair to prove all that can be desired as a breaking up plough, the purpose for which it was designed. Mr. Dutcher, who resides in New York, in his letter to the Institute, thus describes his improved plough:

"The prairies of the west are covered with a heavy growth of grass, peculiar to that country, the roots of which extend downwards 12 or 15 inches, and are as large as a man's finger, and very tough, forming a thick sward, too deep to plough to the bottom, hence they must be cut off by the share of the plough. In order to do this the share must be thin and sharp; this renders it

* We have seen beautiful fields of corn, grown in Western New York, put in with the axe. A single blow was struck into the deep vegetable mold, the corn dropped, and the hole closed with the heel of the shoe. Corn so planted has averaged 66 bushels per acre.

necessary for the ploughman to keep a file constantly with him while ploughing, to sharpen his ploughshare. The share that is now in use, costs eight dollars, and lasts but one season; the mould side of this plough is wood, which causes it to run heavy; whereas my improved prairie plough is composed of cast iron, both the mould and land side, and is so constructed as to be adapted to the reception of the share which is composed of a *cast steel plate* less than one-fourth of an inch thick, and from six to seven inches wide. This thin plate is over two feet long, and is attached to the under side of the mould and land side, forming an angle with them both, and is secured to the wing of the mould side, by means of three bolts, the heads of which are counter sunk in the bottom of the plate or share: thus extending perpendicularly upwards, through the mould side, and are secured upon the face of the mould side by nuts and screws. This share has two rows of holes, so that when it is worn one-fourth of its width, it is removed forward into the second tier of holes, and is worn as much longer as at first; thus wearing it quite out. This share costs three dollars, and will last twice as long as the one now in use—that costs eight dollars, making a saving in two seasons of $13. The ends of the bolts in the face of the mould side, are covered up with an iron plate formed for that purpose. All the wearing part of the plough, being of cast metal, the friction is diminished one-fourth, and much less strength of team is required for its draught. Both these savings cannot be estimated at less than forty or fifty dollars a year in favor of this plough. These ploughs are used with wheels, and take a furrow of from eighteen to twenty inches, sometimes more. The depth of the furrow is usually three inches, and some prefer it less."

PRODUCTION vs. CONSUMPTION.

We frequently hear great complaints, (and they are made, not only in all parts of our country, but in Europe) of the high prices of provisions, grain and meat, many speculations as to the causes, and the probability of their continuance; and while prices have been attributed to almost every assignable cause, we do not recollect that the one we consider the true one has scarcely been alluded to by any one. In our opinion it is plain that the cause lies not in 'combinations,' at home or abroad, but in the fact that production is not equal to the consumption, or in other words the population of the world is increasing in a greater ratio than the means of subsistence. There are several causes that have contributed to this result: 1st. The long continued state of peace which the greater part of the earth has enjoyed for many years, while it has had the direct effect of increasing the population, has taken multitudes from the agricultural class, and added them to those employed in ministering to the other wants and luxuries of life, the manufacturing or the mechanic arts. 2d. The great increase of horses over cattle in all parts of the civilized world not only for the purpose of transportation but for farming purposes. The substitution of the horse for the ox lessens the means of human subsistence in two ways, the large quantities of grain he devours, and the entire loss of his carcass when old. The ox consumes little grain, and when old is at little expense made of more value than at any other period of his life. 3d. The subtraction of immense numbers of able bodied active men from the pursuits of agriculture, and engaging them in the construction of canals, rail-roads, and other works of public utility, converting at once in this manner a large part of the most serviceable part of the laboring population from producers into consumers, and thus making heavy drafts on the resources of the remainder. These causes, not to mention the disinclination which is felt by many to cultivate the earth, or the desire to get rich in some quicker and easier way than by the slow but sure processes of farming, which is so prevalent among the classes of would-be gentlemen in all the civilized world, is sufficient to account for the high price of provisions, and show there is little probability they will be lower, till these causes in some degree cease to exist.

EXTRAORDINARY YIELD OF TURNEPS.

We give the following extract of a private letter from C. Carmalt, Esq. of Susquehanna county, Pa. Surely the drawbacks of which he complains, could not have seriously affected his crop; to which we think the annals of farming in this country will not furnish a parallel.

'Although my turneps were injured by the fly, the grasshopper, and the drouth, I have succeeded in raising a large supply of ruta baga. The spot contained 486 square perches, where the hard pan is nearer to the surface than on any other part of my farm. My two turnep houses average each, *a little more than* 3000 cubic feet; they have been both filled to the brim, and 76 bushels over. You may calculate the number of bushels; I would do it myself, if I was not apprehensive of having my credibility questioned. Many of the turneps measured three feet in circumference. It is also a very general opinion in this neighborhood that our corn was equal to any in the union; and my observations having extended over a thousand miles of travel, I think the conclusion just."

We have complied with our friend's permission in calculating his crop, and find it to be 3758 bushels, *heaped measure*, (or 2815 cubic inches to the bushel) and as the land on which they were grown was 486 square rods (3 acres and six rods) the amount per acre was 1252 bushels. A most irrefragable proof of good soil and good farming.

SUNFLOWER OIL.

Few individuals in the country are aware of the quantities of olive and almond oils, usually called sweet oils, imported annually into this country from abroad; and the number is perhaps still less who know that in the oil of the common sunflower seed, is found a substitute equal in every respect to the oils of France or Italy. Like all plants of such large and rapid growth that mature their seeds the first year, the sunflower exhausts soils rapidly, but where its cultivation has been attempted it has paid large profits. The oil is extracted as from linseed, and the cake or residuum is, like that, excellent for feeding cattle. The following extract is from a letter of J. Smith, Esq. of Maryland, to H. E. Ellsworth of Washington City.

'I planted about an acre of ground a few years since with sunflower, and obtained sufficient seed for nearly a barrel of oil. The oil was extracted by Mr. Barnett. We made use of it for the table, and found it kept well, and was esteemed equal to the best imported sweet oil for every domestic purpose. I have a little of this making (1833) yet remaining and will send you a bottle by the first opportunity. I found the substance of the sunflower too exhausting for the light soil we have on our hills in this neighborhood (Maryland) but have no doubt it will be found profitable in other sections of our country, and particularly in the rich prairies of the west."

We should be pleased to learn that some enterprising farmer had commenced experimenting on this plant. Its yield of seed is abundant in this region, and could scarcely fail, where the means of converting it into oil are at hand, of yielding a handsome profit.

Items in Domestic and Rural Economy.

India rubber is an excellent substitute for leather in constructing valves for pumps.

To prepare husks for matrasses, strip the husks from the ear, cut off the "*stub shot*" ends with a pair of shears, and draw them repeatedly through a hatchel, and they will be fit for use.

Every gate post on the farm should have a small hole bored into it, to be filled with grease and plugged up, to grease the latches and hinges. Want of grease is often observed, but from not having it at hand, it is generally never applied.

Door latches often work unpleasantly and with difficulty from a want of oiling. A few drops upon them will in such cases operate like magic.

Fill your wood houses in the winter with cut wood, and touch none of it till next summer, at which time, by becoming dry, it will be worth twice its present value and there will be no interruption to other work in procuring fuel.

A most excellent application to diminish friction in carriage wheel boxes, is a mixture of grease or soft tallow with pulverized soapstone. Blacklead substituted for the soapstone is next best.

Wood which proves troublesome by snapping on the fire, may be rendered harmless by turning the stick with the *heart inwards*, when all the snapping will be toward the back of the fire.

Hay-racks for feeding animals are best when placed in a vertical position, instead of inclining outwards, as in the former case, there is less liability of the hay being wasted, the heads of the animals will not become filled with hay seed, and their breath will not ascend and render the hay offensive.

To keep up window sash at any desired height, bore a few holes into each side of the sash or of the window frame, and insert in them common bottle corks, allowing them to project about one fifteenth of an inch. The elasticity of these, and their pressure, will accomplish the desired object.

To extinguish a chimney on fire, the great object is to stop the current of air upwards through it. In some tight houses this may be effected in a great measure by shutting the doors and windows, but best by putting out the fire in the fire place and closing it with the fire board.

Ink spots, on the pages of a book. may, if fresh, be entirely removed by a solution of oxalic acid, washing it afterwards with water. Old ink spots may be partially removed. As oxalic acid is a poison, it must be used carefully.

To make an excellent durable water proof grease for boots, heat a pound of tallow in a two quart iron kettle or skillet, put in six ounces of finely shaved India rubber, and continue the heat until it is thoroughly dissolved. A little beeswax added is an improvement. Old overshoes may be used for the India rubber. Boots thoroughly greased with this composition, will completely protect the feet from moisture though exposed a whole day to melting snow.

To close cracks in stoves through which fire or smoke penetrates, apply, while the stove is hot or cold, a mixture of common salt and fresh wood ashes, made into a paste with water. J. J. T.

IMPROVEMENT OF THE MIND.

The culture of the earth is the most important of all labor. The earth acts as the reservoir of support for man and beast. In some parts of the world, nature produces the food necessary for man almost spontaneously. In our climate, this must be accomplished by cultivation. This demands labor,—the toil of the hands, the *sweat of the brow*.

This labor may be *intelligent;* by which it is meant that it may be performed by educated and enlightened men. An educated man, in any profession, is one whose knowledge fits him for that profession; an *enlightened* man is one who has added other and valuable knowledge, and is qualified to apply his knowledge to important purposes.

The successful cultivator of the earth requires that knowledge of agriculture, which will enable him, with a given quantity of labor, to produce the greatest amount of the support of life. This principle, often lost sight of, must be equally true, whether the direct object is the production of food, cotton, or tobacco, which will bring food and support in return; or of cattle, sheep, &c, which will be attended with the same result. This knowledge is to be obtained from the experience of the successful, the theories and reasonings of the judicious, and especially from the experiments yet to be wrought by the enterprising agriculturist. Of all the pursuits and business of life, agriculture is clearly an *experimental*, while it is a *practical*, art.

But there is other knowledge of vast importance to the farmer, and the advantages of which will be experienced by himself and by his country. It is that knowledge which elevates his character and creates influence. We allude not to all that which constitutes a common and good education, such as the knowledge of arithmetic, grammar, geography, &c., which lie at the foundation, resting only on the mere reading and writing of his own language, but to the knowledge of nature and of art, as well as of our own institutions and those of other nations. So broad is this field, that selections must be made, which will be most commanding for

beauty and utility. In this age of bookmaking and diffusion of books, the sources of the proper knowledge are accessible by very moderate wealth. Engaged in the cultivation of the earth, this knowledge makes him familiar with a multitude of operations in the world around us and in the work-shops of art, and especially becomes him who is a minister in the great temple of nature. It is most desirable too in his relations to his family, to society, and to the government, and especially in all his moral relations.

The farmer is to a great extent the owner of the soil. No one has a deeper interest in the institutions of the country. His own prosperity and happiness are connected with the excellence and permanence of our institutions. He is a FREEMAN; and freedom, in no ordinary degree, depends upon him. An intelligent and patriotic yeomanry, a moral and enterprising people, cannot be made slaves or subjugated to the lordly will of a master, as they would be superior alike to intrigue and corruption.

We contend therefore for the education of the whole people; especially for the education of those who are the *lords of the soils*, and whose elevation in knowledge must elevate the great mass of society. We think the subject has not received the attention that it merits, and that must be attracted towards it, if the prosperity of our country is to continue. We do not mean that the great body of farmers do not estimate education highly, and that they are not co-operating with the beneficent efforts of the state, to extend and improve the system of common education. We think their notions, however, are too limited for their own honor and usefulness and enjoyment, and that the views of too many are limited to the education of the common school alone. The reason of this is to be found in the partial education of so great a number, from the very circumstances in which they were placed when young. This reason is their misfortune, *not their fault*. We ask that this reason shall be removed, so far as it can be, by the superior education of the children of the present generation of farmers. With the increase of their knowledge and means of usefulness and influence and happiness, the whole country must feel the invigorating power. In pleading this cause, we advocate the highest interests of the farmer, and as a consequence, the most important objects of all society and government.

We purpose to aid our friends in the agricultural walk of life, in the advancement of their interests by such views of education as shall be suited to the case and the prosecution of which may be in their power. †

SILK.

Mr. Danforth, by the following communications, which came with the silk referred to, and exhibited at the Eleventh Annual Fair, has rendered his countrymen a timely and a most acceptable service. Thousands are commencing, and hundreds of thousands are contemplating the raising of silk. They are seeking information. They require to be informed, in few words, how to commence and how to proceed. Mr. D. has told them, practically, all he did, in plain and simple words, and the results, which are truly wonderful. They have only to go and do likewise. He has told all, from the planting of the mulberrry to the completion of the cocoon. There are volumes on silk that do not afford half the useful information contained in this short account. The beginner cannot mistake. The account is made up of facts, and nothing but facts. Can any one doubt that it is in our power to raise silk to almost any amount that can be named? The work is begun. The enterprise of our country is pressing on the culture of silk; and the first movement for this purpose, the supply of the mulberry, is progressing on a vast scale, covering our country, and surpassing any thing ever witnessed. The propagation of the mulberry is like a creation. In a short period,—two or three years,—millions on millions have come forth, and every new bud becomes a tree. He who doubts our becoming a great silk growing nation, knows nothing of America. Let it be done in a plain, common sense way; let it become an appendage of agriculture; avoid scientific silk growing, by means of great establishments, with thermometers and barometers, taught by large books imported from foreign countries. There is no more necessity for them, in growing silk, than there is in raising chickens; and a great incorporated company, with hundreds of thousands of dollars of capital stock, with presidents, directors, secretaries and treasurers, would be just as likely to succeed in raising eggs and chickens, as silk worms and cocoons. Begin in the simple, domestic way. Employ such domestics as have no employ, or those the least profitably employed. Mr. Danforth, in a note, desires it may be impressed distinctly on those seeking information, *that this was an experiment, made by entire novices; that the feeding was only for two months and ten days, and the crop all produced in four months, including the time of planting the trees, and that the product was ten hundred and ninety skeins of forty yards each.*

TO THE COMMITTEE ON SILK, AMERICAN INSTITUTE:

Gentlemen,—The vast importance of the silk culture to our country, and the eagerness of the public to obtain information respecting it, make it the duty of every one engaged in producing a "silk crop," to furnish his quota of knowledge, that thus a mass of practical information may be collected, from which we may go forward with confidence, and gather in the rich harvest which is before us.

With these views, and in compliance with the solicitation of my fellow-citizens, I give you the result of my experience during the past summer. I would first premise, that in making a trial of the silk culture, it was my desire to adopt a mode which could be followed by our agriculturists at large, rather than to show the greatest possible quantity of silk that could be produced from a given portion of land. Such an experiment, made under peculiar advantages of soil and culture, yielding a large product, might be viewed with admiration, but the means being beyond the reach of the mass of our citizens, the same results could not be attained.

The field from which the experiment was made, was situated in East Hartfort—the soil, of a light, sandy nature, of a quality termed in that quarter, good corn land. It was ploughed about the middle of May, and harrowed and furrowed in the usual manner. The roots and trees (Morus Multicaulis) were now laid down, and covered from two to four inches, the tops having a slight upward inclination; they were placed about twelve inches apart in the row, the rows three and a half feet apart, having been previously moderately manured.

After the field was planted, a section comprising one eighth of an acre was marked off, to be subjected to a more particular experiment. It was stocked with 780 roots and trees, all of one year's growth, having had their tops partially or wholly killed by the severity of the past season. One third were two feet high, one third one foot, stripped of their limbs, and the remainder were roots without tops. By the 1st of June the new shoots began to show themselves, and by the 1st of July they numbered 4,800, and had attained the height of twelve to eighteen inches.

A family of 4,000 worms was now started, which wound up on the 23d July, having consumed 131 lbs. leaves. Three other lots, amounting in all to 28,000, were now put out at intervals of several days, in order to favor the increasing growth of the leaves. By the 10th of Sept. the last had finished their labors. Weight of leaves consumed in Aug., 701 lbs. and in Sept. 332 lbs.

Total weight of leaves gathered	1164 lbs.
Total number of worms fed	32,000
Producing nine bushels cocoons.	
Yielding (so far as reeled) 1 lb. of silk per bushel.	
Weight of cocoons	95 lbs.
Waste silk and floss	1 lb.

Twenty-seven thousand of the worms were of the two crop kind, requiring 4,000 to make a pound of silk and consuming 144 lbs of leaves. The remaining 5,000 were of the long crop six weeks worms, 2,500 of which produced a pound of silk, and consumed 90 lbs. of leaves. It was my intention to have fed the long crop worms entirely, as they are known to be much the most productive of any other kind, but they could not be procured.

Business now calling me away, the feeding was discontinued, and the trees were immediately removed from the ground, having attained an average height of 4½ feet well rooted, and with heavy limbs.

The produce of the one-eight of an acre, as above, it appears is 9 bushels cocoons, or 9 lbs. silk; being at the rate of 72 lbs. per acre, from the feeding between the 1st July and the 10th Sept. It is easy to see, that had the 1,164 lbs. leaves been fed to worms of the 6 weeks kind, the yield would have been 13 lbs. of silk, or nearly—and from the rapidity with which the new leaves were developing when the trees were removed, it is presumed that had they remained during September, enough more might have been added, to have swelled the product, so as to have made the crop at the rate of 125 lbs. per acre.

During the period of feeding, the safety and even advantage to the tree of freequent defoliation was fully proved. The trees from which this experiment was made, were stsipped of their leaves four different times, yet at no time were they inferior to others that were untouched; on the contrary, it was remarked, that where the leaves were removed, the limbs shot forth with greater vigor—care being taken to leave the tender leaves at the ends of the branches.

The very great advantage of this species of mulberry over staddard trees, was manifest; while such trees are difficult of access, and from the small size of the leaves, requiring much labor to gather any quantity, it was easy for a child to take from the Morus Multicaulis 15 to 20 lbs. in an hour.

The plan of retarding the hatching of the eggs by keeping them in an ice house, was found perfectly successful; the worms which wound the finest cocoons were thus kept back until the 3d of August.

It may be useful to new beginners to know, that the large 6 weeks worm, either white or sulphur colored, is altogether preferable to the two crop; for, not only are they more productive of silk, but from their superior length of thread, the reeler is able to produce silk of better quality, and with less labor.

The convenience of a shrub tree, where the farmer wishes to change his crop, may be seen from the fact, that with the use of a plough, the trees on this section of land, 4,800 in number, were turned out of the ground in 30 minutes. An hour more was sufficient to cart them from the field.

Every one who takes up the culture of silk, is surprised at the ease and certainty with which it is produced; and of this experiment it may be observed, that none of the persons who took care of the trees, gathered the leaves, or fed the worms, had ever seen a tree or silk worm before.

I am not acquainted with the comparative merits of the Morus Multicaulis, and other kinds of the mulberry; but large as has been the estimate of some cultivators, of the produce and value of the former, I believe its astonishing power of reproducing foliage, its tenacity of life, and the great ease with which it is multiplied have never been overrated. A friend informs me that a field of roots, deprived of their tops last fall, remained in the ground during winter, and that from the new shoots, which started as early as any other vegetation, he was able to feed from one to two months earlier than from others planted the following May. From these collected facts, we may form an idea of the quantity of leaves, and the consequent weight of silk that may be obtained from the Morus Multicaulis, when it shall have attained greater age, even in this latitude.

I am not able to name the cost of raising silk; but an intelligent culturist of my acquaintance, from a proof of three successive years, rates it at $2 per lb., exclusive of the cost of trees and the tillage; respecting the latter, I am of opinion the labor bestowed on a field of mulberry, need not be more than on a field of Indian corn.

It appears, therefore, that nearly all the labor of raising silk, viz: plucking the leaves feeding the worms, and reeling it into sewings, may be performed by the females of a family, and thus the product be considered a clear gain, like that of any other collateral branch of farming. The growing of silk needs but to be looked into, to be appreciated; and if 100 lbs. can be produced the first year of planting, worth $5, the pound in raw silk, or $9, when in sewings, what other crop, it may be asked, can be named coming near it for profit?

I will only add, gentlemen, that it is cheering to see the interest the American Institute has taken in this all-important subject, and to express the hope, that the coming Exhibition, from our silk growers, and the increased patronage of the Institute, may give to it a fresh interest. Yours, respectfully,

Hartford, Sept. 19th, 1838. J. DANFORTH.

TO THE COMMITTEE ON SILK, AMERICAN INSTITUTE:

Gentlemen,—The accompanying sewing silk, 3 1-2 lbs., is offered for exhibition at the coming fair; and you may consider me a competitor for the premium offered through the Institute in April. This silk was produced from 1-16th of an acre of land, being one-half the section named in the statement annexed. It should be remarked, that the cocoons (4 1-2 bushels) from which it was produced, were sent some 40 miles to be reeled, and consequently were much injured, so as to produce less silk; and from haste in reeling (to prevent *all* the millers from eating out) is inferior in quality to what it would otherwise have been. Weight of waste silk and floss, 1 lb. Yours, respectfully,

New-York, Oct. 3d, 1838. J. DANFORTH.

RUTA BAGA.

We copy the subjoined paragraph from the Lynchburg Virginia, because we know this root to be a valuable acquisition to agriculture, and are pleased to find the good people of the Old Dominion alive to its importance.

We have received from John M. Warwick, Esq. a present of a dozen superb *Ruta Baga Turneps*, grown on his farm, a few miles from town. These turneps were raised on high land, and though enduring the severe drouth of the last season, have attained a size rarely equalled. This successful experiment in raising this root, so valuable not only for the table, but particularly for stock, should be an inducement to engage in its culture.—*Farmer and Gardener.*

COMMUNICATIONS.

The Marcellus Agricultural and Horticultural Society held their annual meeting at the School House in the village of Marcellus, on the first Tuesday in December, John Sanford, Vice President, in the chair, when the following resolutions, offered by L. J. Tieft, was unanimously adopted:

1st. Resolved, That this Society view with deep regret and sorrow the loss they have sustained in the death of the Hon. DAN BRADLEY, their late President.

2d. Resolved, That this society deeply sympathise with the agriculturists of this county, and of the town of Marcellus in particular, who in him mourn the loss of a common friend and father.

3d. Resolved, That said resolutions, together with the doings of the Society, be signed by the President and Secretary, and published in the Genesee Farmer, and that the said resolutions be entered on the journal of the Society.

The Society was then addressed by the Vice President on appropriate subjects, when after the usual business was gone through with, the Society proceeded to the election of officers for the ensuing year, and the following persons were chosen, viz:

JOHN SANFORD, President,
M. L. MILLS, Vice President,
BENJAMIN F. STONE, Secretary,
ZEBULON MOSES, Treasurer.

Executive Committee.

Chester Moses, John C. Field,
Lake J. Tieft, H. Nelson Howe.
George Read,

A true copy from the minutes.

JOHN SANFORD, President.

B. F. STONE, Secretary.

HINTS TO FARMERS.

MR. TUCKER—Having been brought up on a farm, it has always been my delight and pleasure to see good farming. Nothing looks better in my view, than to see a farm kept in good repair—to have first rate stock, and every thing applicable to their comfort and convenience in the inclemencies of a cold and chilling winter. Sheds are highly necessary for a farmer to have who pretends to be a farmer and keep stock. I have heard a great many remark that cattle would do just as well without a shelter as with; but I am far from believing it. It does not look reasonable that stock of any kind will thrive and do as well exposed to the cold blast, as they will to have a good shelter. The winters are so long in this northern country, that it requires very strict attention to cattle and sheep, to have them weather through the cold storms that so frequently are our visiters in this cold and frozen region. I have heard some say that it was no trick to be a farmer, any one might be a farmer, whether he ever worked on a farm or not. Now in my opinion it is as much of a trade to be a good practical farmer in this age of the world, as it is to be a mechanic of any kind. It is a trade to know when the best time is to sow grain of any kind, or to plant corn. Now it is not every one that can go into the wood and cut and split rails, and if the rails were split they would not know how to lay them up in a fence. It being a time of year that the farmer has not much to do, only to see that their cattle have sufficient to eat, now is the time to be learning the best method to pursue our farming the coming year; and to obtain this knowledge we must take a paper, and the most important one is the Genesee Farmer. It contains every thing that is essential to the rules of good farming. If the farmers in this section of country, would, instead of laying out their money for something of no use to themselves nor their families, lay it out for some agricultural paper, and learn lessons of farming therein, it would be far better for them, and better for their children. If those who pretend to be farmers would live up to the rules laid down in the Genesee Farmer, our country would not be overrun with so many noxious weeds as it is at the preesnt day. There is hardly a farm in this vicinity but what is more or less covered with foul stuff. The farmers neglect to destroy them too much. I was brought up to keep the foul stuff from going to seed, and the farm I now live on is entirely free from noxious weeds; and it would be matter of rejoicing if our farmers would believe and derive lessons from the Genesee Farmer, to instill into their children's minds that to be good farmers they must be industrious and economical in all their concerns, and see that their stock has every thing to add to their convenience and comfort in the winter.

W. S. T.

South Venice, Dec. 12, 1838.

APPLES.

MR. TUCKER—I am glad to perceive that your able assistant, J. J. T., has called the attention of farmers to the value of apple molasses, made from steaming them for swine, and I hope those who use this fruit extensively another year will not forget his hints on the subject. For several years past I have used molasses prepared by boiling cider made from sweet apples, and for several purposes find it fully equal if not superior to any other. There is no difficulty in keeping it, as I have now a cask made three years since of excellent quality. This year, instead of boiling, I have steamed my apples for making pork, and from the quality of the liquor remaining in the steamer, I doubt not Mr. T.'s plan would work admirably. I had no opportunity of testing it, however, as I used half potatoes and half apples in preparing food for my swine. There can be no mistake about the value of apples as food for fattening pork; though as you have often stated in your Farmer, they should during the latter part of the process receive meal made of barley, peas, or corn, to give firmness and weight. A neighbor of mine who has just received some 200 dollars for half a dozen pigs, fed them, almost exclusively, on apples until a few weeks previous to slaughtering them, when meal made of peas and corn was added to the boiled apples. Meal of some sound grain is necessary, or the pork, though perfectly sweet and fine flavored, will shrink so much in cooking, as to render it probable it was killed in the wrong time of the moon.

AN EASTERN FARMER.

MR. PHINNEY'S PIGGERY.

MR. TUCKER—Do please ask the Yankee Farmer to inform his correspondent, "A Looker On," that his communication relative to the Piggery of E. Phinney, was any thing but satisfactory; and that we can admit no excuse for his being so indefinite, unless accompanied with *ample* details of E. P.'s method of "cultivating" the pig; such as how they are fed in the different stages of growth? How is the food prepared? At what age are they slaughtered? By what means is so much manure obtained? &c. &c. A plan of the stye would be valuable to many, who like myself are desirous that their pigs should have every opportunity for improvement.

BACON.

INQUIRY.

MR. TUCKER—You published a piece in the Monthly Genesee Farmer about a one horse thrashing machine. Would not Davenport's galvanic machine answer in room of a horse? I shall be glad to learn whether they have come into use, and if so what will be the cost, and by whom made?

A SUBSCRIBER.

From the Quarterly Journal of Agriculture.

AGRICULTURAL CHEMISTRY---No. 2 *

BY HENRY R. MADDEN, ESQ. L. R. C. S. EDINBURGH.

Having, in my last paper, given a brief outline of the chemical composition of soil, I proposed in the next place to consider what was necessary in soil to fit it for maintaining vegetable life. The first point to be considered therefore, obviously must be, what do plants require for their nourishment, or, in other words, What is the food of plants? In treating this question, there are so many chemical terms which must be employed, and so many chemical changes to be explained, that it will be absolutely necessary, in the first instance, to give a brief account of the various component parts of vegetables.

When vegetable matter is completely disorganised, as, for example, by fire, it is found to consist of those *elementary* substances, to which chymists give the names of *carbon*, *oxygen*, *hydrogen*, and sometimes also a minute quantity of *nitrogen* or *azote*. The manner in which these substances are combined in the plants when living is entirely unknown; but, nevertheless, an acquaintance with their general properties is essential, in order to understand how they are brought within the limits of vital action.

Carbon exists pure in nature in the *diamond*, and mixed with other substances, it forms *plumbago*, *charcoal*, *coke*, &c. Whenever it is obtained pure artificially, it is in the form of a black powder; of the various forms in which this substance presents itself, charcoal is the one which we should more particularly notice, as this is the form in which *carbon* is obtained from vegetables. It must be well known to all that charcoal is procured by heating wood in *close* vessels. Considered chemically, this substance consists of a large quantity of *carbon*, together with various saline ingredients; this may be easily seen by burning charcoal, the *carbon* alone is dissipated, and the saline matter is left in the form of white ashes. The chemical relations of carbon, which it will be necessary to explain in this place, are chiefly its affinity for *oxygen*.* These two bodies, when united together in the proportion of 6 parts of the first to 16 of the second, form the well known gas *carbonic acid* (choke-damp); they also unite in various other proportions, giving rise to very different products; but these are not of such importance to the agriculturist. Let us now, therefore, consider the properties of carbonic acid. This gas, as I have already stated in my last paper, always exists in a free state in the atmosphere, and in the form of choke-damp; and when combined with various other substances, it constitutes that class of bodies which chymists denominate carbonates, as carbonate of lime (chalk), carbonate of soda (common salt), which consists of lime and soda, respectively combined with carbonic acid. It is always formed when charcoal, or any substance containing carbon, is burned in the air, for since the atmosphere contains oxygen, and these two bodies (carbon and oxygen) cannot be brought into contact at a high temperature without uniting, it is clear that this gas must be formed when charcoal is heated in the air; in point of fact it is the attraction of these two substances for one another which produces combustion. There is still another mode, however, by which these substances may be made to combine, namely, when either of them is presented to the other in a *nascent* state. To explain what is meant by the term nascent state, I may quote a familiar example. In a common soda or effervescent draught when you dissolve the contents of the two papers separately, and then add the solutions together, effervescence takes place, owing to the escape of carbonic acid gas from the carbonate of soda. Now the gas, at the moment that it leaves the soda, is said to be in its *nascent* ('coming into being') state. The union of carbon and oxygen may be conveniently expressed by saying that the oxygen dissolves the carbon.

Oxygen is the next elementary principle which we have to consider; when free it is always in the form of gas, in which state it exists in the atmosphere, constituting one-fifth of that important æriform mass, the remainder being *nitrogen*; it also exists in immense quantities in combination with other bodies, for example, eight-ninths of all the water of the globe is oxygen; in fact, it has been calculated that one-half by weight of the whole globe is oxygen. This gas is absolutely necessary to life, both animals and vegetables speedily losing life if deprived of it. With regard to its chemical relations to carbon, we have already spoken at considerable length, a few words will therefore suffice. We have before remarked, that, to form carbonic acid only 6 parts of carbon are dissolved by 16 parts of oxygen, but in plants these two elements are never in that proportion, the carbon being alway in excess; hence, when wood is burned to ashes in the open air, in which case *all* the carbon is dissolved, a large quantity of the oxygen necessary for that purpose is supplied by the *atmosphere*: and hence also, when wood is burned in *close* vessels, carbon in the form of charcoal is left, as in this case the only oxygen which can be obtained is that existing in the wood itself.

Hydrogen.—This gas most probably does not exist in the free state in any considerable quantity, but it is contained in large quantities in various compounds, as, for example, in water, all vegetable and animal matters, &c. The chemical relation of this gas which we shall consider is chiefly with oxygen. These two elements combine in the ratio of one to eight, and form the familiar fluid *water*; they may be made to combine in the same ways as carbon and oxygen, namely, by heating

* For No. 1, see page 278, current volume, Genesee Farmer.

* I have not thought it necessary to give a minute explanation of the different chemical terms which I have to mention, as I can scarcely conceive it possible that any of my agricultural readers can be totally ignorant of a science, a general knowledge of which may be gained from almost every periodical in the three kingdoms.

various organic substances which contain them, or by bringing either of them in contact with the other in a *nascent* state. Hydrogen unites also with carbon, forming various gases, oils, &c., but these are not so immediately connected with the subject of my present paper, as to require any particular consideration. Let us, therefore, direct our attention to the last of the four elements which compose vegetable matter, *nitrogen* or *azote*, as it is often named. This also is a gas when not in a state of combination. It exists in nature abundantly, forming, for example, four-fifths of the atmosphere; it is also contained in large quantities in *animal* matter. Vegetables, however, contain it in very small proportions; in fact, a great many have none at all; we shall not, therefore, require to say any thing more concerning it at present. The *earthy* and *saline* matters found in the plants are, for the most part, the same as those found in earth, viz: silica, alumina, carbonate of lime, magnesia, &c., and several salts, which likewise frequently exist in the earth in small quantities, as *carbonate of potassa* (potashes), *muriate of soda* (common sea-salt), &c. These saline matters will come to be considered more at length when we are treating of the plants themselves.

Having completed this brief sketch of the components of vegetable bodies, let us now see what natural compounds exist, which may be made the means of supplying plants with these various ingredients. We have seen that the generality of plants contain (in addition to saline matter) three elements only, namely, carbon, oxygen, and hydrogen, and that a few contain a small proportion of nitrogen; we have seen, on the other hand that *carbon* and *oxygen* exist abundantly in nature in the form of *carbonic acid;* that *hydrogen* and *oxygen* are even more abundant in the form of *water;* and that *nitrogen* and *oxygen* are most abundant of all in the form of *atmospheric air*. Hence we might be led to conclude at first sight, that *carbonic acid*, *water* and *air*, could supply all that was wanted by vegetables, and since air always contains both the others (water and carbonic acid), one might suppose that it alone would be sufficient for maintaining vegetable existence. How widely this differs from truth it is needless to say. We all know that most of the higher orders of plants cannot be made to vegetate without *soil*, *manure*, *water*, *air*, *heat*, *light*, and, most probably, *electricity;* hence it is clear that we must examine more carefully into the *physiology* of vegetable life before we can arrive at any conclusion, as to what is essential, and what superabundant.

It is certainly true that some seeds will germinate and even produce apparently healthy plants, without either *soil or manure*, if supplied with *air*, *water*, &c.; but nevertheless, these plants are not to be considered by any means perfect; for, in the first place, they do not contain any saline ingredients, except the small quantity which pre-existed in the seed; on which account, plants grown in this manner do not possess that degree of firmness of texture which would have been the case had they been grown under circumstances more congenial to their habits; and, moreover, we may rest assured of the fact, that unless plants are supplied with every thing which they contain when in a state of nature, they need never be expected to thrive, or produce any valuable return for the trouble and expense attendant upon their cultivation. From these remarks, I think it will be apparent to all, that it is useless to attempt an investigation of the food of plants, until we are perfectly acquainted with their *physiology*. To this important point, accordingly, we must now turn our attention.

In an undertaking like the present, of course it will be impossible to give more than a superficial sketch of the functions of vegetables; but, in doing so, we must endeavor, as far as possible, to omit what is purely theoretical, and enlarge only upon such points, the knowledge of which is absolutely necessary in a practical sense.

Plants may be said to consist of two great parts, the root and the stem, with their various appendages. But since we are in this place merely to consider one function of vegetable life, namely, the function of *absorption*, or the manner in which plants bring matter, external to themselves, within the range of their vital actions, we may confine our researches almost entirely to the *roots* and *leaves*,—these being, beyond doubt, the parts by which extraneous matter is first received into the plant; and, in the first place, let us examine the functions of the root.

The term *root* is generally considered to include all that part of the plant which is beneath the surface of the soil. This, however, is not strictly correct; for many plants possess what botanists call a *rhizoma*, or underground stem. The true root is that part of the plant which, from the instant of its bursting the covering of the seed, begins to direct its course downwards (or towards the earth's axis), "with a tendency so powerful, that no known force is sufficient to overcome it." Moreover, it differs from the stem in many of its characters; thus it does not divide itself into smaller fibres in the regular manner, in which stems generally give off their branches. Again, it never produces leaves or scales; and another important distinction is, "that it never becomes green (at least in its tissue) when exposed to the action of air and light, while all the other parts of vegetables, when thus exposed, assume that color." The root is divided into the body and fibres, the latter of which will alone claim our attention. These fibres are furnished at their extremities with a remarkable structure, which, from its resemblance to a sponge has been termed *spongiole*. It consists of an extremely loose texture, and is most probably merely "the newly formed" internal "tissue" of the root itself, deprived of its more dense covering, or *cuticle*, as it is termed. This opinion is very much strengthened by the well-established fact, that roots grow by their extremities only. In this manner the spongiole is always being renewed; and what is of still more consequence, is never *long in one place*. On this account it is that plants which live many years (if not growing too near each others of the same kind) are not liable to die from having exhausted the soil; or in other words, are not liable to be starved to death; for it is evident that, by the constant *change of position* of the spongiole, which is the only part of the root by which nourishment is received into the plant, there must be a constant supply of food, so long as the soil around it contains any organic matter in a fit state for absorption. It has been shown, by innumerable experiments, that the spongioles, or absorbent extremities of the roots, cannot take up any thing but fluids; or, at all events, if they can absorb solids, they must be in such a minute state or division, that they would remain suspended in water, even for a considerable time, which is a fineness of particles far greater than will probably ever be attained by any *mechanical* means.

It has likewise been proved, that plants are capable of choosing, to a *certain* degree, their food; or, in other words, of selecting those substances which are best adapted for their peculiar nature, and rejecting what would be injurious. This power, however, appears to be limited, as it is perfectly possible to destroy a plant by giving it poison by the roots. The root, moreover, has the power of *excretion*, or returning to the earth such matters as are either useless or injurious. From this last property of roots, we may draw two valuable conclusions; *first*, That in order to poison a plant, the substance used must be capable of acting rapidly, or it will most probably be rejected before it has had time to produce its effect; and, *secondly*, that since plants reject substances *useless* and *injurious* to them, the soil where they grew may in time become so impregnated with such substances as to render it incapable of supporting the same species of plant any longer; or at least until such time as the rejected matter shall have been decomposed. This point will be enlarged upon when we come to treat of the rotation of crops. The next purpose which the roots of all land, and the majority of aquatic plants, serve, is obviously to fix it firmly in its place. On this account, we find, in many cases, that a certain proportion exists between the size of the stem and the root. This, however, is subject to exceptions. But, on the other hand, in all cases an obvious relation may be perceived between the *form* of the root and the kind of soil in which the plant grows. Thus, if two specimens of the same plant—some of the grasses, for example—be found growing, the one in clayey, the other in a sandy soil, it will be seen on examination, that the root of the one growing in the sand is much more minutely subdivided, and contains many more small fibres, than the one which grew in clay; and the reason of this is obvious: We have already seen that the spongioles are the only absorbent parts of the root; that they exist only at the extremities of the smallest fibres; and moreover, that they can take up nothing but what is presented to them in the form of solution. Now, in the clayey soil, from its retentive nature, the soluble parts are not allowed to drain away; and hence the plant is supplied with food near at hand, and consequently, a few short fibres are sufficient. On the other hand, plants growing in sand are frequently deprived of all fluid near them, by the sinking of the soluble matters through the loosely aggregated soil; in which case the plant would inevitably perish from starvation, were it not for the wise law of Nature, which provides against such calamities, by endowing the roots of plants, placed under such circumstances, with the power of shooting forth innumerable minute fibres in all directions, in order that advantage may be taken of every drop of moisture which falls in their neighborhood. Nor is it merely in the number of minute fibres that the roots of plants growing in sand differ from those which inhabit the stiffer soils. The form of the body of the root is distinct; thus, nearly all bulbous, and other large succulent roots —as the turnep, for example—require sandy soil; and, moreover, some plants—as that species of grass named *Phleum pratense*, (meadow cat's tail, or Timothy grass) —change the form of the root, according to the soil they inhabit; thus, in stiff clays, the plant just mentioned has a fibrous root, whereas in sand it becomes bulbous, and assumes all the characters of *Phleum nodosum*. The explanation here is as evident as in the former case. The bulbs of the roots act as *reservoirs of food* for the plant; thus, in very dry seasons, these bulbs shrivel up, their fluids being all needed by the rest of the plant, and hence withdrawn. So beautifully do we perceive in this, as in all other cases, that design and adaptation of means to specific purposes, which must impress even the most sceptical with the absolute existence of a *Great First Cause*. So much for the root and its functions.

Important and complicated as these may appear, the *leaf* performs offices of a much obscure nature. In the words of the justly celebrated Lindley, "Leaves are at once organs of respiration, digestion, and nutrition. They elaborate the crude sap impelled into them from the stem, parting with its water, adding it to carbon, and exposing the whole to the action of the air." To describe fully in this place these numerous operations would not only occupy far too much space, but would to a certain degree, be foreign to our subject, as all we we wish to examine at present is, how the nutritious matter gets into the plant, putting completely out of sight the question as to what becomes of it after it is absorbed. From the sentence above quoted, we find that *carbon* is added to the sap by the leaves. By this is not meant, however, that it is without that substance until it reaches these organs, but merely that an extra quantity of this element is hereby added to it. How, therefore, is this accomplished? We have already repeatedly stated, that carbon always exists in the atmosphere in the form of *carbonic acid gas*. Now, it has been ascertained that the leaves, while exposed during the *day* to the sun's rays, have the power of absorbing this carbonic acid, and afterwards decomposing it, the *carbon* being retained, and the *oxygen* given out again in the form of gas. During the *night*, however, or in the shade, no such change takes place. Carbonic acid, indeed, may be absorbed, probably in the form of a solution in water, as it is well ascertained that leaves take up moisture during the night; but it does not appear to undergo any decomposition; part of it, in fact, is given out in an undecomposed state; and as oxygen is removed from the air, at the same time that this evolution of gas is going on, it is supposed that plants have the power during the night of absorbing oxygen, which dissolves part of their carbon, and re-escapes in the form of carbonic acid. Thus we see that, during the night, the exact reverse is taking place to what was effected while the leaves were exposed to the rays of the sun. In the latter case, carbonic acid being absorbed, the carbon is retained, and the oxygen evolved; whereas in the former oxygen is absorbed, and carbonic acid given out. What is the ultimate effect of these complicated and apparently inconsistent changes, it is hard to say. The fact, however, remains unalterable; and from it we may draw at least two very valuable conclusions: *first*, From what we have said with reference to the formation of *carbonic acid gas* during the burning of vegetable matter, and since it is well known to all that this gas is likewise contained in great abundance in the breath of all animals, it is clear that, unless there were some process in constant operation of removing it from the air, our atmosphere would soon become so contaminated with this noxious gas (choke-damp), that it would be incapable of supporting life. Now, it has been conjectured that this constant absorption of carbonic acid by plants during the day, and the evolution of oxygen (the constituent of air most essential to life), has the effect of preserving the healthy condition of the atmosphere. *Secondly*—But on the other hand, it is equally important to remember that the reverse takes place during the night; plants at that period *vitiating* the air; which accounts for its not being healthy to sleep in apartments where a great number of plants are growing. But to return from this digression. From the facts above stated, we find that the leaves absorb carbonic acid and water; and, for the present, we shall rest content with this, and proceed at once to consider of what the food of plants really consists,—now that we are so far acquainted with that important function exercised by plants—namely, absorption—by means of which they receive their nourishment. And, in the first place, we may briefly show the analogy which exists in this particular between plants and animals; by doing which we must be enabled to render the sequel much more intelligible. It is well known to all who are conversant with the functions of living animals, that after the food is received into the stomach it undergoes certain changes; one of the most important of which is its being rendered *soluble*, and afterwards is *absorbed* by a special set of vessels called *lacteals*, and is then carried to the lungs to be converted into blood. Now, the analogy is perfect, if we take into consideration that plants have no stomachs and, therefore, all the preparation which takes place in the stomach of animals has to be performed in the *soil*. Hence Greisenthwaite, a most ingenious writer on this subject, says,* "The soil may be

* New System of Agriculture, by Greisenthwaite. Second Edition, p. 103.

regarded as the stomach, the common receptacle of the food of plants, in which manure is converted into substances that are soluble; and afterwards those soluble substances are absorbed by the capillary tendrils of the roots, in a manner exactly similar to that already observed of the *lacteals* in animals." A moment's reflection will at once, therefore, clear up all difficulties; for we perceive that the *spongioles* of the roots act exactly as the *lacteals* of animals,—namely, they absorb the soluble matter prepared in the stomach (soil), and carry it to the leaves to be converted into *perfect sap*, which process likewise corresponds exactly to the conversion of the matter absorbed by the lacteals into perfect blood.

The food of plants may therefore be said to consist of the soluble parts of the *manure*, and likewise of *carbonic acid*. We must next, therefore, consider, *first*, Of what does the soluble part of the manure consist, or, what must it contain in order to be sufficiently nutritious to the plants which absorb it? *secondly*, How is this matter rendered soluble? and, *thirdly*, What is the best method of producing a constant and equable supply of this soluble matter to the plant? These are all questions of such fundamental importance to insure the successful practice of agriculture, that each of them must be considered separately. The third point, however, must be deferred until we treat of manures.

First, then, of what does the soluble matter of manure consist? On that point there has been the greatest difference of opinion; some confidently asserting that all that is absorbed by the roots of plants is water holding in solution carbonic acid, and various saline matters; others, again, suppose that in all cases a distinct vegetable compound is formed, to which they have given the various names of *Ulmin, Humin, Humic acid* &c. Now, as far as practice is concerned, it really is not of much consequence whether the composition of the soluble matter of manure is, in all cases precisely the same or not; in fact it would be easy to show that it could not be so; as, for example, the soluble matter of *animal* manures will contain *nitrogen*, which cannot be the case with that derived from most *vegetable* matters; again, and this is of the greatest importance, the saline impregnation will frequently be different. But the diversity of opinion above mentioned, may, nevertheless, give rise to errors in practice, unless the point be in some measure decided; for, on examining into the question, it will be found that those who hold the food of plants to be merely *carbonic acid water* and *saline matter*, evidently suppose that the vegetable matter must be *completely* disorganised, before it can be available to the wants of vegetables; whereas, the supporters of the last opinion, namely, the formation of *Humic acid*, &c., manifestly consider that partial destruction only is necessary, or, in other words, they suppose that, during the decomposition of organic matter, one of the first steps is the rendering of insoluble matters *soluble*, and that as soon as this change is effected, they are capable of being absorbed by the spongioles, and carried into the general circulation. Now, the adoption of the first of these opinions may be dangerous to successful practice in the following manner:—If it be supposed that all that is requisite in manure is, that it should furnish the plant with a constant supply of *carbonic acid*, it would not be considered of any importance whether the manure was obtained from the *animal* or *vegetable* kingdom; in fact, the latter would be preferred, in so far as it is decomposed more slowly, and hence its effects would last longer; but were such a practice to be persevered in, the farmer would soon find reason to regret that he had changed his *routine* practice, in order to adopt the suggestions of scientific men; for it would inevitably happen that two at least, if not many more, of his most valuable crops would fail completely under such a system of husbandry, I mean his *wheat* and *turneps*. Let us now see why these would fail more than others, or, to express it differently, let us ascertain what these plants require, which is not capable of being supplied by the decomposition of "*common vegetable matter*" by which term is meant such vegetable substances as contain only *carbon, oxygen*, and *hydrogen*. On analysing the *grain* of wheat, and the *bulb* of the turnep (the parts for which the crops are cultivated), it is at once found that both of them contain *elementary* principles not entering into the composition of "*common vegetable matter*," namely, *nitrogen* in the grain of the wheat, and *sulphur* in the turnep, besides which the *saline* matter is also found to be peculiar, but this last will be considered more fully hereafter. Having once, therefore, discovered that these elements are essentially necessary for the growth of the abovementioned plants, we are evidently led to ask ourselves the question, Whence are they to be obtained? Dear bought experience has long since answered, *in animal manures*. Yes, all substances derived from the animal kingdom contain more or less of both nitrogen and sulphur, and hence the value, or, in fact, the absolute *necessity*, of such manures for the particular crops now under consideration. It may, indeed, be said by some, that "however necessary animal manures may be for turneps, still there can be no absolute necessity for their application for the wheat crop, for, as nitrogen is the substance here wanted, surely the atmosphere will present a ready and never-failing reservoir of that element." But it must here be remarked, in answer to such a statement, that it is exceedingly probable that the *higher* orders of plants, at least, *never* obtain the nitrogen they possess from the atmosphere, but always from decomposing *animal* matter. The consideration of this interesting subject, however, we must defer until we treat of the theory of "*specific manures*."

Before speaking of the next opinion, I must briefly call the attention of my readers to the important fact, that, although *practice* has long ago shown the necessity of *animal* manures for the abovementioned crops, still *chemical analysis* alone could ever have explained the *reason* for this necessity; thus placing the advantages to be derived from this science in a truly prominent and important light. To return, however, to the more immediate subject of the present paper, we may observe, in the next place, that, were the second opinion, with reference to the food of plants, to be considered as implicitly correct, this likewise might lead to serious losses in the following manner. Those who adopt this theory evidently consider that the *soluble organic matter* formed during the decomposition of manure, is the chief agent by which the nutrition of vegetables is effected, and hence, by them, all the other parts of the manure will be comparatively overlooked, or altogether rejected; now, although, as far as the supply of organic matter is concerned, this practice would not be attended by any serious losses of *crops*, still it would lead to a most unwarrantable waste of *manure*. It has been long ago proved, that, during the formation of these soluble matters in manure, a large quantity of *carbonic acid* is given off; hence it follows, that were these soluble matters prepared before the manure was applied to the soil, the whole of this valuable substance would be lost; whereas, on the other hand, were they formed *in* the soil, the carbonic acid gas, as it was generated, would either be dissolved in the water always existing in soil, and in this state be absorbed by the roots, or it would rise into the air in the form of gas, and thus supply the leaves with the *carbon* which these organs have the power of fixing during the day. It is, therefore, perfectly clear, that in this, as in all other cases, "*virtus stat in medio*." and that, in order to ensure successful practice, we must never allow ourselves to be carried away by *any* theory, but must give to each opinion its due share of importance; and, in this manner, by guarding as well against prejudice as against too great credulousness, we may rest assured, that our improvements will proceed much more rapidly and certainly than they do at present, and may confidently look forward to the time when the philosopher and the farmer will proceed hand in hand, each alike encouraging the other, but at the same time checking their progress should either show any inclination to outstrip the other: since, beyond doubt, the old maxim of "*slow but sure*" holds as true here as elsewhere. After the remarks already made, it must appear clear to all, that the soluble matter of manure *must* essentially consist of *carbon, oxygen, hydrogen*, and for some particular plants, *nitrogen*, together with various saline matters: but, at the same time, that these elements need not be in the form of *carbonic acid, water*, and *air*, but in any state of combination as long as they are *soluble*.

The next question must, therefore, now be considered. How are these matters rendered soluble? This point is one of the greatest importance to the agriculturist, because on it depends the success of all his operations; for since we have proved, that whatever manure is used it must be first rendered soluble, it is perfectly clear, that a correct knowledge of the manner in which this change is effected would greatly increase the chances of their successful application. Unfortunately, however, it is a subject involved in the greatest obscurity, and, I must confess, that it is with fear and trembling that I enter upon its consideration. So much has been already said, and so many theories already advanced, in reference to this truly interesting but mysterious subject, that it would be impossible, in an undertaking like the present, to even mention them all; we must, therefore, confine our observations to those theories only which appear to us the most deserving of consideration, and, in doing so, it will be found that not one has yet been made known, against which many serious objections may not be advanced.

First, then, the most important probably of all the theories, is the very old one, namely, that the various component parts of vegetables are rendered soluble by undergoing those peculiar chemical changes which constitute the process of putrefaction. Now, in an abstract sense, this is certainly true; we have only to watch the process of decay as it occurs in a common dunghill, and we shall at once see, that, during the various changes which take place there, the mass becomes more and more soluble, until at last the woody parts are so far softened and reduced, that the whole will cut like so much moist earth; and if water be poured upon it at this period, it will be found to acquire a dark brown color; which fluid, when dried up, will yield what has been termed *extractive matter*, &c. (*impure humic acid*). From this, therefore, it is evident that insoluble vegetable matter is rendered soluble during putrefaction. If, however, we examine *rich loam*,—or, in other words, soil in the *best possible* state for growing crops, we shall not be able to detect the soluble matter, in the manner already mentioned. For example, were we to steep the earth in water, or even to boil it with that fluid, it would in most cases, impart little or no color to it; and the water when dried up, would hardly yield any thing but a minute quantity of saline matter. Here, therefore, a great difficulty arises: How is it that water, naturally existing in soil, is able to dissolve this organic matter, and render it fit for the use of vegetables—whereas, if water is poured upon the earth, or even if the earth is steeped for a length of time in that fluid, scarcely any appreciable quantity of vegetable matter is dissolved? This is the objection which has given rise to all the other theories which we shall have to mention. Until the above important fact was known—namely, that water does not dissolve any material quantity of vegetable matter from even the best soils—agriculturists were perfectly content with the theory already adverted to; but in this the age of research, nothing is allowed to be passed over; all theories are now sifted to the bottom; and, to one unacquainted with the mysteries of science, it will appear truly astonishing that so many theories should have been overthrown within the last few years, which stood for centuries previously without contradiction.

Of all the ideas which have of late been advanced, in the hope of explaining away the objection above alluded to, two only will, for the present, engage our attention. The first has been advanced by those who imagine that the soluble matter of soil is at all times essentially the same, or in other words, those who believe in the existence of *humin* or *humic acid*. These individuals endeavor to explain it on strictly *chemical* principles. They have ascertained, by experiment, that if the soil is boiled with a solution of any alkali (as potass or soda), a considerable quantity of vegetable matter is in this manner dissolved, which gives the fluid a dark brown color, and from which the vegetable matter can be obtained either by adding some acid (oil of vitrol for example), or by evaporating the whole to dryness, in which latter case the organic matter is found in combination with the alkali. These facts certainly prove that there exists a something in the soil, which is soluble in acids, and is, therefore, so far possessed of the essential properties of an acid; hence the term *humic acid*.—Those, however, who have gone still further, and who, by various chemical processes, have separated this acid from soil, have likewise shewn that with lime (the alkali by far the most frequently existing in soil) this acid forms a compound of very little solubility, although capable of suspension in water; and in this manner they endeavor to overcome the difficulty about water not being able to dissolve any considerable quantity of vegetable matter from soil. They have further shown that *humic acid* itself is quite *insoluble* in water. However this may be—and it is no doubt true that these changes can be made in the labratory—still it does not appear what material advantage would be gained by the adoption of this theory; because if humic acid is itself insoluble in water, and moreover, forms an insoluble compound with *lime*, it would almost invariably be in a useless state, as there is hardly any soil which does not contain more or less *lime*, and as the great requisite is solubility, which could in this case only be produced by the humic acid combining with some such alkali, as *potass, soda*, or *ammonia*, none of which are ever abundant in soil.

Another theory which has been advanced appears to be nearer the truth—namely, that the *spongioles themselves* of plants exert a peculiar influence over the organic matter in contact with them, and cause peculiar chemical changes to take place in it, by means of which its insoluble parts are rendered soluble. Now, that this may be the case, is exceedingly probable; but it would be extremely difficult to *prove* that it were so. That this action of the spongioles, however, is not absolutely necessary to effect the decomposition of vegetable matter, is proved by the fact, that soil will in time become exhausted, even although no vegetable whatever is growing in it; in which case, of course, the decomposition could not have been effected by spongioles. The action, likewise, of some *mineral* manures tend to throw doubts upon this theory.

We must, however, now leave this interesting subject, as it has already occupied too much of our space; and I am certain that, from the observations that have been made upon it, it will be evident to all, that a great many doubts have yet to be cleared up, and numerous difficulties to be explained away, before we can hope to form any satisfactory opinion upon the point, the greatest difficulty evidently being to devise some method

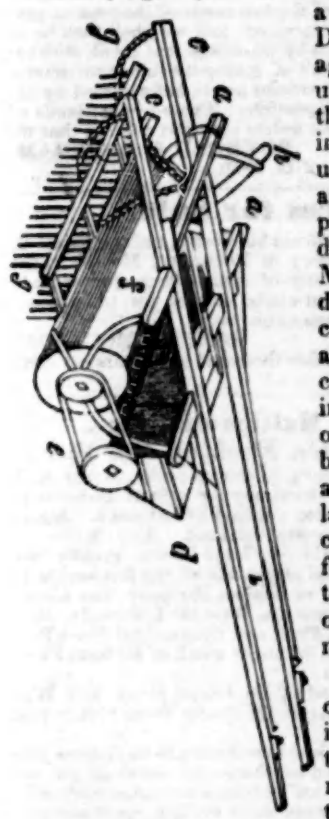
of *observing* the functions of the spongioles, without placing them under *unnatural circumstances*. I must, nevertheless, confess that there is no subject with which I am acquainted that appears to me more deserving of careful *scientific* investigation. It is comfortable, however, to reflect, that we at least know the important fact, that plants *can* absorb organic matter, mingled with the soil in which they grow; so that, *practically*, the question as to *how* they *prepare* their food for absorption, is not of such vital importance. We shall next consider the various methods that are had recourse to in order to prepare soil for cultivation.

From the London Farmer's Magazine for October.

DESCRIPTION OF A GRASS SEED SOWING-MACHINE.

BY MR. DUDGEON, BROOMHOUSE, EAST LOTHIAN.

(Fig. .)



This machine, of which a model was lodged by Mr. Dudgeon about 12 months ago in the Society's Museum, is an amplification of the common broadcast sowing-machine, so frequently used for sowing grass-seeds, as well as for its legitimate purpose—the sowing of the different kinds of grain.—Mr. Dudgeon seems to have devoted his attention to the construction of a machine, adapted to perform the processes of sowing, then rolling, and lastly, harrowing at one operation; and he has been the first to bring such a method before the Highland and Agricultural Society. The machine, at full size, has been certified to perform these combined operations in a satisfactory manner.

In the annexed cut, this compound machine is exhibited in perspective, wherein the combination of the harrow and the roller are detailed along with the sowing apparatus, and may be shortly described as follows:—*a a* are the fore and hindbars of the top frame set at the distance of 2 feet apart, their length being about 7 feet 4 inches. To these are bolted down the horse-shafts *b* of the ordinary length, but having in addition, the extension bars *c c* bolted to the end of the shafts. The seed-chest *d*, 6½ feet in length, is appended to the lower side of the horse-shafts, immediately in front of the fore-bar, and may be fitted up in all respects similar to the common broadcast seed-chest, the spindle which carries the small discharging toothed wheels being put in motion by a belt or chain passing over a pulley *e*, 12 inches in diameter, on the projecting end of the spindle; the belt or chain receiving its motion from another pulley of 9 inches diameter, placed on the axle of the roller, now to be described. The roller *f f* which is also 6½ feet in length, is about 28 inches in diameter, though this is not imperative, nor is the material of which it is made of any essential importance. The roller is supported by its journals in two semicircular bars of malleable iron, or they may be of cast iron, bolted to the extremities of the fore and hind bars *a a*. From the semicircular bars proceed also two stays for the further support of the seed-chest. The harrow *g g* is suspended immediately behind the roller; it consists of two frames each 3½ feet in length, and 1 foot in width. These are jointed end to end, forming a harrow 7 feet in length, having only two rows of tines. The tines are set at 2½ inches distant, and, as the tines of the one row alternate with those of the other, they will make a rut at every 1¼ inch. The direct suspension of the harrow is effected by means of chains from the moveable bar *h*; this being jointed at the one end is capable of being raised from the horizontal position to the position *h*, or to any intermediate point, and retained there by a pin passed through a quadrant over which the bar moves; by this means the harrow is regulated as to depth, while by means of a link from the semicircular bars, and by the chain from the extremity of the extension bars *c c*, it is duly stayed in a proper position, while it has sufficient freedom of swing to insure its useful effect. The joint at the middle of the harrow allows it to accommodate itself to the rounding of the ridges when required. The lever seen in the middle of the top frame is, through its connection with another lever on the back of the seed-chest, used for opening and shutting the orifices, and for regulating the discharge of the seed, by moving a long slide plate in the usual manner.

It may be remarked of this machine, that the particular succession here shewn, that is to say *sowing*, *rolling*, *harrowing*, is not considered essential to its success; and that any other, as *rolling*, *sowing*, *harrowing*, may, under different circumstances of soil and management, be found equally successful.

From Gov. Everett's Address before the Bristol School convention

Personal Efforts Rewarded.

It is a great mistake to suppose that it is necessary to be a professional man, in order to have leisure to indulge a taste for reading. Far otherwise. I believe the mechanic, the engineer, the husbandman, the trader, have quite as much leisure as the average of men in the learned professions. I know some men busily engaged in these different callings of active life, whose minds are well stored with various useful knowledge acquired from books. There would be more such men, if education in our Common Schools were, as it well might be, of a higher order; and if Common School libraries, well furnished were introduced into every district, as I trust in due time they will be. It is surprising, Sir, how much may be effected, even under the most unfavorable circumstances, for the improvement of the mind, by a person resolutely bent on the acquisition of knowledge. A letter has lately been put into my hands, bearing date the 6th of September, so interesting in itself, and so strongly illustrative of this point, that I will read a portion of it; though it was written, I am sure, without the least view of publicity.

"I was the youngest, (says the writer,) of many brethren, and my parents were poor. My means of education were limited to the advantages of a district school, and those again were circumscribed by my father's death, which deprived me at the age of fifteen of those scanty opportunities, which I had previously enjoyed. A few months after his decease I apprenticed myself to a blacksmith in my native village. Thither I carried on indomitable taste for reading, which I had previously acquired through the medium of the society library; all the historical works in which I had at that time perused. At the expiration of a little more than half my apprenticeship, I suddenly conceived the idea of studying Latin. Through the assistance of an elder brother, who had himself obtained a collegiate education by his own exertions, I completed my Virgil during the evenings of one winter. After some time devoted to Cicero and a few other Latin authors, I commenced the Greek At this time it was necessary that I should devote every hour of daylight and a part of the evening to the duties of my apprenticeship. Still I carried my greek grammar in my hat, and often found a moment, when I was heating some large iron, when I could place my book open before me against the chimney of my forge, and go through with *tupto*, *tupteis*, *tuptei*, unperceived by my fellow apprentices, and to my confusion of face a detrimental effect to the charge of my fire.—At evening I sat down unassisted and alone to the Iliad of Homer, twenty books of which measured my progress in the language during the evenings of another winter. I next turned to the modern languages, and was much gratified to learn that my knowledge of Latin furnished me with a key to the literature of most of the languages of Europe. This circumstance gave a new impulse to the desire of acquainting myself with the philosophy, derivation,, and affinity of the different European tongues. I could not be reconciled to limit myself in these investigations to a few hours after the arduous labors of the day. I therefore laid down my hammer and went to New Haven, where I recited to native teachers in French, Spanish, German and Italian. I returned at the expiration two years to the forge, bringing with me such books in those languages as I could procure. When I had read these books through, I commenced the Hebrew with an awakened desire of examining another field; and by assidious application I was enabled in a few weeks to read this language with such facility that I allotted it to myself as a task, to read two chapters in the Hebrew Bible, before breakfast each morning; this and an hour at noon being all the time that I could devote to myself during the day. After becoming somewhat familiar with this language, I looked around me for the means of initiating myself into the fields of Oriental literature, and to my deep regret and concern I found my progress in this direction hedged up by the want of requisite books. I immediately began to devise means of obviating this obstacle; and after many plans I concluded to seek a place as a sailor on board some ship bound to Europe, thinking in this way to have opportunities of collecting at different ports such works in the modern and oriental languages as I found necessary for this object. I left the forge and my native place to carry this plan into execution. I travelled on foot to Boston, a distance of more than a hundred miles to find some vessel bound to Europe. In this I was disappointed and while revolving in my mind what step next to take, accidentally I heard of the American Antiquarian Society in Worcestor. I immediately bent my steps towards this place. I visited the Hall of the A. A. S. and found there, to my infinite gratification, such a collection of ancient, modern, and oriental language as I never before conceived to be collected in one place; and Sir, you may imagine with what sentiments of gratitude I was affected, when upon evincing a desire to examine some of these rich and rare works, I was kindly invited to an unlimited partcipation in all the benefits of this noble institution. Availing myself of the kindness of the directors, I spent about three hours daily at the hall, which with an hour at noon and about three in the evening, make up the portion of the day, which I appropriate to my studies the rest being occupied in arduous manual labor.

Through the facilities afforded by this institution, I have been able to add so much to my previous acquaintance with the ancient, modern and oriental languages, as to be able to read upwards of FIFTY of them, with more or less facility."

Fattening Pork, Curing Hams, &c.

I am satisfied that it is "not good economy" to endeavor to make manure from hogs by keeping them up in a pen. I am convinced that ten bushels of corn, fed on a clean board, will make as much good solid pork, as fifteen fed on a dung heap—and with this additional recommendation, that the pork is perfectly sweet and entirely free from that nauseous flavor which is so peculiar to pork kept in a filthy state, and having their food administered to them in dung or litter. The greatest care must be observed. The hog is not by any means naturally a dirty animal.

I have noticed frequent inquiries in the Cabinet as to the best method of curing pork and hams. I would inform all inquiries that they cannot have good, sweet meat, unless it is both good and sweet before it goes into the tub. The best of salt cannot make bad meat good—but will prevent good meat becoming bad. In some parts of the country where I have dined, the pork served up at table has tasted so strongly of the pen that I could not eat it. So much for making manure from hogs. I have always had good pork and hams since I fed my hogs on a board floor, which is kept well cleansed.

On one occasion I purchased a lot of Jersey pork, 2,000 pounds. It was fat and very handsomely dressed but it lacked one essential requisite—that good flavor which characterizes all good pork. Subsequently, I bought a lot of 2,500 lbs. raised in Bucks county. The hogs were fed on a clean board floor, with Indian meal; they had an abundance of water. No one could desire finer or sweeter meat. A few years since, I put up some pork fattened on sweet apples, with the exception of the last two weeks, during which time they were corn fed; and the pork was as sweet, solid, and fine as any I ever saw. The hogs roamed at large in the orchard until I put them up to be fed on corn.

RECEIPT FOR CURING PORK AND HAMS.

As soon as the pork becomes cool I cut and sort it, taking great care to have the tubs perfectly sweet and clean. In cutting, I take out all the spare ribs, and make pickled pork of all the side between the ham and the shoulders; cutting it into pieces of suitable size for family use. I trim the hams and shoulders well. I cover the bottom of the tub with rock salt; and then put in a layer of pork, nicely packed; then cover this layer with salt, and so on until the tub is filled. I use rock salt, and very bountifully. In six or eight days make a pickle of salt and cold water, as strong as possible, and cover the pork previously salted with it. It will then keep for years if you choose.

In preparing the hams and shoulders, I weigh several to come at the probable weight of the whole. They are packed with great care in suitable tubs. My process is to sprinkle some coarse salt at the bottom; then pack in the hams and shoulders firmly, side by side, being careful not to put the back of one flat on the top of another. The spaces are filled up with chines, hocks, and jowls. To about every three hundred weight of meat I take thirty pounds of rock salt, one pound of saltpetre, and fourteen pounds brown sugar, or half a gallon of good molasses, (generally the latter.) Take as much pure water as will cover the meat, put it in a clean vessel, add the above articles, boil it, removing the scum as it rises, and when no more rises, set it to cool, after which pour it on the meat until it is covered 3 or 4 inches.

If the hams are small, weighing from 12 to 15 lbs., let them remain in the pickle five weeks—if from 15 to 24, six weeks—if from 25 to 45, seven weeks. When you remove them for the purpose of smoking, put them in clean, cold water for two or three hours. If there is too much salt or saltpetre adhering to the surface of the hams, the water will take it off. The smoke should be made of clean green hickory. A fire should be built only in dry weather. And when the meat has acquired a yellow tinge, not red or black, they are removed, and hung up in a dark place, where they are not disturbed by flies or vermin.

DAVID COMFORT.

Byberry, 6th mo., 1838. [*Farm. Cabinet.*

[To the above recipe, which we know to be a good one, we would only add, that a little red pepper should be

rubbed over the inside of the pieces of meat, and over the top of the hock—the object of the red pepper is to keep out skippers, which it effectually does.]—*Farmer and Gardener.*

Mulberry Trees and the Silk Business.

Extract from a letter from Mr. Chauncey Stone of Burlington, N. J.

In replying to your questions it will be necessary for me breifly to recapitulate them. Question

1. Have you been long engaged in cultivating the mulberry?
2. What species of morous do you deem preferable, and what kind of soil suits it best?
3. What is the best mode of propagating, planting, and managing it?
4. What is the value, expense and profit on an acre of mulberry trees for the first five years inclusive?
5. What kind of worm do you consider the most valuable?
6. What help does it require to raise 100 pounds of silk?

First.—I am one of the number who first commenced the silk business in this vicinity, and have devoted the two last years with close application practically to the culture of the morus multicaulis and rearing the silk worm.

Second.—I have taken much interest during the last few years in comparing the relative qualities of the different mulberries; and at present I know of none better than the morus multicaulis for this and the more southern latitudes for the silk business. The alpine, the Canton, and the Brusa, are excellent species, and may be well adapted to the more northern latitudes. Most of the different species I have seen, which are fourteen or fifteen varieties, require four or five years' growth before having much foliage to part with; but the multicaulis will yield a large quantity the first year's growth without injury to the tree, and is eaten with great avidity by the silk worm. The mulberry that is most productive of fruit is less productive of foliage. The multicaulis produces very little fruit, and is not often grown from the seed. It will flourish on all soils where the peach does.

To select a location on which to plant a field for the silk business, I would prefer undulating grounds, having a deep mellow loam, and mixed with sand and gravel sufficient to prevent the soil from baking or crusting.

Third.—After having the ground made mellow, lay out the field in rows about four feet apart, and the surest mode, by taking one season with another, is to lay the tree down full length and cover deep enough to keep moist. The time for planting in this latitude, I think, will be during the first and second weeks in April, in common seasons. By planting a field of mulberries in this mode they must be taken up in the autumn, as they will stand too near each other to remain in the ground. But to plant a field of mulberries not to be taken up in the fall, my own views are to lay out the rows about five feet apart, and in the autumn take up every other tree in the rows, leaving them standing four feet apart; the remainder to have the tops cut off near the ground in the fall. In the following spring, many shoots from each stump will start up with vigor, and produce an abundance of foliage, and easy to be gathered. And where the field is large, I think every fifth row may be omitted and not planted, but used as a passage for a cart or wagon in which to transport the foliage to cocoonery. Our experiments made this season have proved the feasibility, that mulberry treated in the above manner will fulfil the most sanguine anticipations.

Fourth.—To answer this question it will require some philosophical speculations, as the feeding of silk worms from an acre of multicaulis of four or five years' growth has not been done by me, or under my observation. At the rate of fifty pounds of reeled silk to the acre has been produced from the first year's growth of trees.—But from an acre to be planted in the manner I have described, 30 pounds the first year will be a fair production, and by leaving the roots in the ground and pruning the tops in the autumn, I deem it not extravagant to estimate one hundred pounds reeled silk yearly on an average, the four succeeding years after the first year's growth of trees.

After the cocooneries and fixtures for feeding are prepared, we can feed the silk worms and reel the silk at an expense not over two dollars and fifty cents per pound and it is then worth from four dollars and fifty cents to six dollars a pound to the manufacturer.

Fifth.—At present I know of none I prefer to the white mammoth worm, so called, but we have a kind that spins a large yellow cocoon, and is a very good kind. The silk of the white is worth most. We have a kind called the two crop kind, that can be reproduced the same year, but they spin a small cocoon.

Sixth.—It requires a person having experience to take charge of the feeding, who can manage during the first week alone after the worms hatch, and the second week a boy or girl will be wanted to pick leaves, and after that another person, equal to a full hand, will be all that will be required to finish the crop, which will be about three hundred thousand in number.

By this calculation I expect the cocoonery to be convenient to the mulberry field. It requires two hands to change the worms dexterously, but they can attend to that in the morning when the dew will be upon the leaves and to gathering the foliage after the dew shall disappear. A stock of leaves will always be wanted before hand, lest there should be rainy weather, when they cannot gather them.

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Those who raise silk and wishing to sell it in its raw state, had better reel it into skeins, and is then in a merchantable condition.

I have answered your interrogatories in a manner that appears most feasible to my views, but I do not pretend to lay down any particular modes or systems as applicable to all future generations.

SHELTER FOR SHEEP.

Though it is not best to confine sheep to a close shelter even in very cold weather, yet they should, during the cold season, have a shelter where they can go in very severe weather and where they can find a protection from storms. When sheep lay out in cold storms, their fleeces become wet, cold, and often frozen, and they suffer greatly by such exposure, frequently taking cold which either destroys them or reduces them to a very feeble state, so that they are of little or no profit to the owner; he loses the advantage of an increase in his flock, and frequently loses the fleece. A feeble sheep seldom raises a lamb, for while the mother is in poor health, she can barely get support for herself, of course she cannot sustain her offspring. A poor sheep has a poor fleece, and much of it is often lost off before shearing time.

Some farmers pay but little attention to protecting their sheep from storms, supposing that as they have a warm fleece they may be safely exposed to all kinds of weather. And they can endure a great degree of cold while dry; but when wet their fleeces afford but little protection; on the contrary they are frequently an annoyance, being a cold wet mass in contact with their tender skins. It even causes a shudder as we think how much the poor innocent animals suffer from cold storms. Clothe a man in good thick garments, and while dry they will enable him to endure severe cold, but wet them throughly and then let him feel the rigorous cold of a northern winter and he will shrink from a touch of these garments which instead of protecting him, produce a deadily chill, and this course would soon destroy the strongest constitution.

Every one should consider that poor "Nanny," with a wet jacket in cold weather, is like a man with wet garments, in a suffering condition, and should be protected. Even when sheep have a shelter to which they can repair in stormy weather, it is necessary that they should be driven under their shelter, and confined their during rain storms or snow storms that will be likely to produce wetness in the fleece. This subject is far more important than it is generally supposed.

There is danger of keeping sheep too warm in winter by having a large number sheltered in a small space.—They should have a plenty of room and fresh air.—Sheep and lambs are much better for going out and taking exercise in the open air.—*Yankee Farmer.*

The Magazine of Horticulture,

BOTANY and all useful discoveries and improvements in rural affairs, a monthly publication, by Hovey & Co. Boston, price three dollars a year.

This is the most popular, scientific and practical work of the kind in the United States. It contains numerous original communications from eminent American Horticulturists, and valuable selections from the European Magazines, notices and descriptions of new and beautiful plants, flowers, fruits and vegetables, with observations on their history, use, propagation and culture, directions, with plans and engravings, for constructing and managing greenhouses, hothouses, frames, &c. with particular instructions for the propagation and culture of green house plants, and the management of plants in rooms. An account of the proceedings of the Massachusetts and other Horticultural Societies, and descriptions of the principal gardens, nurseries, greenhouses, &c. in the United States.

This work should be read and patronised by every lover of Horticulture and friend of improvement. The fifth volume will commence with the ensuing year. Specimens may be examined at the Rochester Seed Store, where subscriptions are received by

Dec. 8.–3t REYNOLDS & BATEHAM.

Wheat Farms for sale in Western New-York,

IN the counties of Monroe, Orleans, Genesee and Erie—varying in quantity from 50 to 300 acres each—under a good state of cultivation and improvement, with suitable buildings, fences, &c. watered with durable streams, and most of them have wheat on the ground. Five to eight years credit can be given, if wanted, on the whole principal sum, with annual interest. These farms are situated in the midst of a rich agricultural district, unsurpassed in the richness and productiveness of its soil; lying on the banks of the Erie canal, and in the vicinity of Rochester, Lockport and Buffalo, affording at all times a ready and sure market for all the articles of produce, which at present prices amply reward the husbandman and enables him with a few crops to pay the first cost of his lands. A favorable opportunity is here presented to the enterprising farmer who would wish to obtain a good farm on liberal credit, with sufficient means to secure the payment of one-third of the purchase money. Letters (post paid) promptly attended to.

Rochester, N. Y., Dec. 8, 1838.–4w JOHN C. NASH.

WM. PRINCE & SONS, will make sales of Trees and Cuttings of the genuine Chinese Morus multicalis, Morus Expansa, Alpine, and other varieties, deliverable to the purchasers at such periods in the spring as they may find it convenient to take them, and will enter into contract accordingly. Prices of the trees, &c. will be forwarded to all who may apply for them by mail, and also of Silk worms Eggs, Seeds, &c. The trees are very superior as respects their vigor, and the genuine multicaulis having been first imported by us, purchasers are sure of obtaining the genuine article.

Flushing, near New York, Dec. 10, 1838. dec 15 4t

Chinese or Tree Corn.

A SMALL lot of this celebrated new variety of Corn just received from Mr. Thorburn, for sale at New York prices, by

Nov. 24. REYNOLDS & BATEHAM.

Genuine Morus Multicaulis.

THE subscriber has still for sale, one thousand genuine Morus multicaulis, of thrifty growth and untrimmed. They are choice trees, selected for their size, and will afford a large quantity of cuttings. ASA ROWE.

Greece, October 27th, 1838.

Seeds for 1839.

WE are daily receiving our fall supply of SEEDS for the coming season and advices have just been received from London, of the shipment of a large invoice of English seeds of the present year's growth. They will shortly be received, and we shall then be prepared to supply dealers and others by wholesale and retail, with such articles, and at prices as cannot fail of giving the fullest satisfaction

Orders from abroad where the articles are to beforwarded by navigation, should be sent as soon as possible. Those of our friends who have already favored us with their orders may rest assured that their wishes will receive due attention. REYNOLD & BATEHAM.

Rochester Seed Store, October 27th, 1838.

Fruit Trees for Sale.

THE subscriber respectfully informs his friends and the public that he has for sale at his Nursery in Rochester, Monroe county, state of New York, a large quantity of Fruit Trees, grafted and inoculated with the most approved kinds, now fit for transplanting, which he will sell on the most reasonable terms.

April 15, 1838. SAMUEL MOULSON.

N. B. Cash will be paid for a few thousand two years old APPLE TREES.

Chinese Morus Multicaulis, &c.,

At the Linnæan Gardens, Flushing, New York.

50,000 SPLENDID trees of the genuine Morus multicaulis are yet remaining for sale at moderate prices, according to their size, and also cuttings of the same. None of the *Aumbug* kind are sold at this establishment. Also 20,000 trees of the Morus Expansa, which has very large leaves, greatly loved by the worms; it is very hardy, and yields silk of the first excellence. A great supply of the Moretti, or Alpine Mulberry, the Canton, Dandola, Broussa, Asiatic, Pyramidalis, Rose of Lombardy, Morus Alata, and other varieties. Also, Fruit and Ornamental Trees, Plants and Seeds of every kind, and an immense stock of Bulbous Flower Roots, just arrived from Holland.

Silk Worms' Eggs of every kind at the lowest prices, and White Italian, Canton and Moretti, or Alpine Mulberry Seeds in any quantity.

The Morus Multicaulis trees raised here have one-third more joints and buds than southern trees, and of course are worth 50 per cent. more for propagation; and the wood becomes as mature and perfect on the high exposed position our nurseries occupy, as at any place in the Union. Also, Fruit and Ornamental Trees, Bulbous Roots, Green House Plants, and Seeds of all kinds, for sale in large or small parcels.

Priced catalogues will be sent to every applicant, and orders per mail will be executed with as much precision and despatch as if the purchasers were present, and will be packed so as to be sent to the remotest region with safety.

nov 17-8t] WM. PRINCE & SON.

From the Wisconsin Culturist.

W. P. PROUDFIT, Esq., Editor W. Culturist—Dear Sir: We have perused a letter from Lucius B. Allen, Esq. accompanied by an editorial comment, which without proper explanation is calculated to mislead the public. It appears that Mr. Allen received seeds from Dr. Stebbins, of Northampton, Mass., which he deems the *Morus multicaulis*, and from which he states he has raised 30 to 40,000 trees. We have simply to say that there never has been one ounce of genuine Morus multicaulis seed sold in the Union, and that all the trees raised from seeds *professedly* of the Morus multicaulis, have proved to be none other than an improved variety of the White Mulberry, with much larger leaves than the White Mulberry, but possessing no resemblance to the genuine Morus multicaulis. All such applications of the term "Multicaulis," meaning *many stalks from one root*, are totally improper, and any such terms as Alpine Multicaulis, or Canton Multicaulis, are delusive. The Alpine is the Moretti Mulberry of France, and was originated there from seed, and is *not known in China*, and all efforts to import the genuine Multicaulis from China have as yet proved abortive, and there exists no proof whatever that it is to be found there, although in all probability it does, but at some locality not yet ascertained. The genuine Multicaulis was brought from the Phillippine Islands to France, and was first imported into America by ourselves. It is time these errors should be put a stop to, as thousands of dollars have been already lost by persons cultivating and propagating the wrong tree. The seed from Dr. Stebbins no doubt produces valuable trees, but let them be called by their *true name*, and not by one totally distinct, and the use of which may mislead people at a distance, although here it cannot. In the whole village of Northampton there were not 50,000 trees of the genuine Morus multicaulis raised the present season, but they have there many other fine varieties in abundance [nov 17-8t] WM. PRINCE & SON.

Monroe Horticultural Garden and Nursery.

GREECE, MONROE COUNTY, N. Y.

THIS establishment now comprises over 20 acres, covered compactly with trees and plants in different stages of their growth.

The subscriber offers to the public a choice selection of Fruit Trees, of French, German, English and American varieties, consisting of Apples, Pears, Plums, Peaches, Cherries, Apricots, Nectarines, Quinces, Currants, Gooseberries, Raspberries, Grape Vines, Strawberries, Ornamental Trees, Shrubs, Plants, Hardy Roses, Vines, Creepers, Herbaceous Perennial Plants, Bulbous Roots, Splendid Peonies, Double Dahlias, &c. &c.

Also, a large collection of Green House Plants, of choice and select varieties, in good condition.

Orders respectfully solicited. Trees and Plants, when ordered, are carefully selected and faithfully packed, and if desired, delivered on the Canal, one mile from the Nursery, or at Rochester.

Orders for Mr. Rowe's Nursery received by the publisher of this paper.

Catalogues will be sent to every applicant, gratis, or may be had by calling at the office of the Genesee Farmer

April 1, 1838. ASA ROWE.